CoE197s

Sean G. Cabalse

2015-04566

Exercise 6: Networking

1. Listing Networks

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
554c44214086   bridge    bridge    local
4a50b4166b2e   host      host      local
a7e0d60f881a   none      null      local
```

2. The default bridge network

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network inspect bridge
[
    {
        "Name": "bridge",
        "Id": "554c44214086e39e9ccdef378a071c169a399de8c5f0c86751f2eb642d97004c",
        "Created": "2021-05-19T13:13:10.5471098Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.17.0.0/16"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "966c9b2d89e906c931d973b0ce99b3edec667984dac3801f6992168b4f534853": {
                "Name": "apache",
                "EndpointID": "0f604efb952e670aa56ada125d14f06d451ec8481a4b89adda1f589b12c4abe6",
                "MacAddress": "02:42:ac:11:00:02",
                "IPv4Address": "172.17.0.2/16",
                "IPv6Address": ""
            }
        },
        "Options": {
            "com.docker.network.bridge.default_bridge": "true",
            "com.docker.network.bridge.enable_icc": "true",
            "com.docker.network.bridge.enable_ip_masquerade": "true",
            "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
            "com.docker.network.bridge.name": "docker0",
            "com.docker.network.driver.mtu": "1500"
        },
        "Labels": {}
    }
]
```

CoE197s

Sean G. Cabalse

2015-04566

Exercise 6: Networking

1. Listing Networks
2. The default bridge network
3. Managing custom networks
4. Adding containers to a network
5. Connecting between containers in a network
6. Binding ports to the host

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker run --rm -d --name dummy seancabalse/ping
d2b235ecd741d3e614cb83971c0f0cd11cfad6def967a80719774ab70ded6e86
```

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network inspect bridge
[
    {
        "Name": "bridge",
        "Id": "554c44214086e39e9ccdef378a071c169a399de8c5f0c86751f2eb642d97004c",
        "Created": "2021-05-19T13:13:10.5471098Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.17.0.0/16"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "966c9b2d89e906c931d973b0ce99b3edec667984dac3801f6992168b4f534853": {
                "Name": "apache",
                "EndpointID": "0f604efb952e670aa56ada125d14f06d451ec8481a4b89adda1f589b12c4abe6",
                "MacAddress": "02:42:ac:11:00:02",
                "IPv4Address": "172.17.0.2/16",
                "IPv6Address": ""
            },
            "d2b235ecd741d3e614cb83971c0f0cd11cfad6def967a80719774ab70ded6e86": {
                "Name": "dummy",
                "EndpointID": "7eb4bb5d05f4bc5bf474baced371f9ca841d6fd91ab3b9551e4bf655ba293241",
                "MacAddress": "02:42:ac:11:00:03",
                "IPv4Address": "172.17.0.3/16",
                "IPv6Address": ""
            }
        },
        "Options": {
            "com.docker.network.bridge.default_bridge": "true",
            "com.docker.network.bridge.enable_icc": "true",
            "com.docker.network.bridge.enable_ip_masquerade": "true",
            "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
            "com.docker.network.bridge.name": "docker0",
            "com.docker.network.driver.mtu": "1500"
        },
        "Labels": {}
    }
]
```

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker run --rm -d -e PING_TARGET=172.17.0.2 --name pinger seancabalse/ping
d04b28e64eba6acdd6ad57edb53782c5d90f3445eeedbfae0ca2ac95b17b1993

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker ps
CONTAINER ID   IMAGE              COMMAND                  CREATED          STATUS          PORTS                                   NAMES
d04b28e64eba   seancabalse/ping   "sh -c 'ping $PING_T…"   11 seconds ago   Up 10 seconds                                           pinger
d2b235ecd741   seancabalse/ping   "sh -c 'ping $PING_T…"   3 minutes ago    Up 3 minutes                                            dummy
966c9b2d89e9   httpd:2.4          "httpd-foreground"       11 minutes ago   Up 11 minutes   0.0.0.0:80->80/tcp, :::80->80/tcp       apache

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker logs pinger
PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.068 ms
64 bytes from 172.17.0.2: icmp_seq=2 ttl=64 time=0.064 ms
64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp_seq=4 ttl=64 time=0.050 ms
64 bytes from 172.17.0.2: icmp_seq=5 ttl=64 time=0.052 ms
64 bytes from 172.17.0.2: icmp_seq=6 ttl=64 time=0.043 ms
64 bytes from 172.17.0.2: icmp_seq=7 ttl=64 time=0.105 ms
64 bytes from 172.17.0.2: icmp_seq=8 ttl=64 time=0.052 ms
64 bytes from 172.17.0.2: icmp_seq=9 ttl=64 time=0.063 ms
64 bytes from 172.17.0.2: icmp_seq=10 ttl=64 time=0.057 ms
64 bytes from 172.17.0.2: icmp_seq=11 ttl=64 time=0.075 ms
64 bytes from 172.17.0.2: icmp_seq=12 ttl=64 time=0.107 ms
64 bytes from 172.17.0.2: icmp_seq=13 ttl=64 time=0.049 ms
64 bytes from 172.17.0.2: icmp_seq=14 ttl=64 time=0.161 ms
64 bytes from 172.17.0.2: icmp_seq=15 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp_seq=16 ttl=64 time=0.050 ms
64 bytes from 172.17.0.2: icmp_seq=17 ttl=64 time=0.063 ms
64 bytes from 172.17.0.2: icmp_seq=18 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp_seq=19 ttl=64 time=0.107 ms
```

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker run --rm -d -e PING_TARGET=dummy --name pinger seancabalse/ping
docker: Error response from daemon: Conflict. The container name "/pinger" is already in use by container "d04b28e64eba6acdd6ad57edb53782c5d90f3445eeedbfae0ca2ac95b17b1993"
. You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker stop dummy
```

3. Managing Custom Networks

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network create skynet
2ee59e059e69af0c41d0f01a174cd2cbb4dbac626e097dd7402e77e57acd163f

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network ls
NETWORK ID     NAME      DRIVER    SCOPE
554c44214086   bridge    bridge    local
4a50b4166b2e   host      host      local
a7e0d60f881a   none      null      local
2ee59e059e69   skynet    bridge    local

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker network inspect skynet
[
    {
        "Name": "skynet",
        "Id": "2ee59e059e69af0c41d0f01a174cd2cbb4dbac626e097dd7402e77e57acd163f",
        "Created": "2021-05-19T17:08:46.3660357Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.18.0.0/16",
                    "Gateway": "172.18.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
```

4. Adding Containers to a Network

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker run --rm -d --network skynet --name dummy seancabalse/ping
749a4302a5cf84cca4a7bb58346c13a755ec03e6d96fe779f0e701ecc2b5be4b

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker logs pinger
PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.068 ms
64 bytes from 172.17.0.2: icmp_seq=2 ttl=64 time=0.064 ms
64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp_seq=4 ttl=64 time=0.050 ms
```

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker stop pinger
pinger

C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker stop dummy
dummy
```

5. Connecting between Containers in a Network

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker ps -a
CONTAINER ID   IMAGE                COMMAND                  CREATED          STATUS                      PORTS     NAMES
7c1c5bd663a3   postgres             "docker-entrypoint.s…"   33 seconds ago   Exited (1) 32 seconds ago             gadgetdb
a31d84437a94   postgres             "docker-entrypoint.s…"   2 minutes ago    Exited (1) 2 minutes ago              widgetdb
7507bc61902c   ubuntu:16.04         "/bin/bash"              3 hours ago      Exited (0) 2 hours ago                pedantic_chan
```

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker stop widgetdb gadgetdb
widgetdb
gadgetdb
```

6. Binding ports to the host

```
C:\Users\Dell\OneDrive\Desktop\Academic\CoE197s\ME8\6-networking>docker run --rm -d --name widgetdb --network skynet -p 5432:5432 postgres
df11135cc3f0f712033e21f0db1d0c24d61b0a76e7f25294e04c8ba24ae87a18
```